

REMARKS

The present patent application was filed on July 19, 2006 (claiming priority to International Patent Application PCT/IB2003/005129 filed on November 13, 2003 and published in English with Publication No. WO 2004/056470 A1 on July 8, 2004, under PCT article 21(2), which in turn claims priority from European Application No. 02028555.7, filed on December 20, 2002) with claims 1-23. Claim 23 has been withdrawn in response to a previous restriction requirement and Applicants previously canceled claims 2, 3, 18 and 19 without prejudice. Therefore, claims 1, 4-17 and 20-23 are presently pending in the application. Applicants herein propose to amend claim 1. Support for the amendment can be found, for example, on page 17, lines 2-5, FIG. 1 and page 14, lines 25-28 of the specification. No new matter is being introduced.

The Office Action objects to the Information Disclosure Statement filed on May 16, 2008 for allegedly not submitting complete copies of the cited non-patent literature documents, rejects claims 1, 4-7, and 20-22 under 35 U.S.C. §112, second paragraph, as being indefinite for allegedly failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, rejects claims 1, 4-7, 9, 10, 14-17, and 20-22 under 35 U.S.C. §102(b) as allegedly being anticipated by Church (United States Patent No. 6,432,360) (hereinafter "Church"), rejects claim 8 under 35 U.S.C. §103(a) as allegedly being unpatentable over Church in view of Richter et al. (Advanced Materials (2000) 12(7): 507-510) (hereinafter "Richter"), rejects claims 11 and 13 under 35 U.S.C. §103(a) as allegedly being unpatentable over Church in view of Korlach et al. (United States Publication No. 2003/0044781) (hereinafter "Korlach"), and rejects claim 12 under 35 U.S.C. §103(a) as allegedly being unpatentable over Church in view of Mian et al. (United States Patent No. 5,686,271) (hereinafter "Mian").

The comments of the Examiner in forming the rejections are acknowledged and have been carefully considered.

OBJECTION

Applicants are submitting herewith a corrected IDS in response to the objection and, as a result, Applicants respectfully request withdrawal of the objection.

§112 REJECTIONS

As noted above, the Office Action rejects claims 1, 4-7, and 20-22 under 35 U.S.C. §112, second paragraph, as being indefinite for allegedly failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Office Action rejects claims 1, 4-17, and 20-22 under 35 U.S.C. §112, second paragraph, because the meaning of the term “homogeneous monolayer” appearing in line 11 of independent claim 1 is allegedly unclear.

Applicants respectfully submit that the proposed amendment to claim 1 including the limitation of “a homogeneous area, and wherein the homogeneous area comprises a monolayer of molecules on the surface” provides sufficient clarity and thus overcomes the rejection. Applicants additionally point, by way of example, to page 17, lines 2-5 of the specification, wherein it states that

[u]se of solutions with low concentration of templates and conditions unfavorable to fast binding of templates to the surface permit conservation of templates and patterning of homogeneous areas on the surface.

Applicants also point, for example, to FIG. 1 for a basis of support. Thus, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. §112, second paragraph rejection of claims 1, 4-7, and 20-22.

§102 REJECTION

As highlighted above, the Examiner rejected claims 1, 4-7, 9, 10, 14-17 and 20-22 under 35 U.S.C. §102(b) as allegedly being anticipated by Church. Applicants respectfully submit that

the amendment to independent claim 1 overcomes the rejection by result of the Church reference not teaching or disclosing the limitation of self-completing amplification of the seed molecules via an amplifying reaction to produce the monolayer on a flat surface, wherein self-completing amplification of the seed molecules via an amplifying reaction to produce the monolayer
5 comprises producing a homogeneous area, wherein the homogeneous area comprises a monolayer of molecules on the surface, and wherein the monolayer of molecules on the surface has no diffusive component that can relocate and destroy amplification accuracy. Applicants, by way of example, point to FIG. 1 (for example, surface 1) and page 14, lines 25-28 of the specification for support of the noted amendment.

10 On page 4, the Office Action states that

[r]egarding claim 1, Church teaches a method for producing a monolayer of molecules on a surface (see columns 8-15) comprising...

(c) self-completing amplification of the seed molecules via an amplifying reaction to produce the monolayer (column 15, line 56 teaches amplification of the
15 transferred seed molecules; see column 13, line 58 - column 14, line 67 for further description).

Applicants respectfully note that Church (the cited passages and otherwise) does not teach or disclose self-completing amplification as is currently claimed. Additionally, Applicants
20 assert that Church does not teach printing to a flat surface or production of a homogeneous monolayer. Church discloses techniques using swollen gels as the soft transfer medium (for example, polyacrylamide, cellulose, polyamide (nylon) and cross linked agarose, dextran, and polyethylene glycol). All such materials require a large fraction of water to be able to adsorb nucleic acids in the matrix. Claim 1, and the supporting specification, however, discloses a
25 transfer medium that cannot be formulated into a gel and which carries the nucleic acids on the surface and not attached to a three-dimensional matrix.

Further, the concept of a self-completing amplification cannot exist in a setting such as taught by Church because the surface in a gel is larger than on a flat surface such that it would not be possible to saturate the gel matrix and run into a self-completion. Additionally, the

printing process as taught in claim 1 is from a source surface to a target surface, which has a much higher lateral resolution than gel transfer techniques such as taught by Church.

Also, as noted above, Applicants respectfully submit that Church does not teach the limitation of the monolayer of molecules on the surface having no diffusive component that can relocate and destroy amplification accuracy. As described in the specification (for example, at page 14, lines 25-28), primers are prevented from lateral diffusion through anchors on the source surface as well as on the target surface and also during the self-completing amplification. The self-completing amplification process is performed and, as detailed in claim 1, without that the primers become diffusible. As such, the techniques can be performed on a flat surface directly exposed to the soluble fraction of the replication mix with no need for a compartmentalization during the replication process.

Further, page 5 of the Office Action states that

[r]egarding claims 6, 7, 9, and 10, the PCR amplification taught by Church is a directional amplification method that is inherently controlled by the geometry of the seed molecules. The amplification is also controlled by application of an external force, specifically heating (see, for example, columns 13-14). Finally, the nucleic acids amplified by the method of Church are inherently conductive structures.

Applicants respectfully disagree with the above interpretation and note that there are many orders of magnitude between a metal and a long molecule

Page 5 of the Office Action also states that “[r]egarding claim 20, the monolayer produced by Church inherently protects the surface from etchants.” Again, Applicants respectfully disagree and note that there are many orders of magnitude between a metal and a long molecule.

Consequently, Applicants respectfully submit that Church does not teach or suggest all of the limitations of amended claim 1. “A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art

reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Thus, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. §102(b) rejection of independent claim 1, as well as claims 4-7, 9, 10, 14-17 and 20-22 which are dependent therefrom.

§103 REJECTIONS

As highlighted above, the Examiner rejected claim 8 under 35 U.S.C. §103(a) as allegedly being unpatentable over Church in view of Richter. Specifically, the Examiner, on page 6 of the Office Action, stated that “Church teaches the method of claims 1, 4-7, 9, 10, 14-17 and 20-22, as discussed above.”

Applicants respectfully submit that, as detailed above, Church does not teach or suggest every claim limitation of amended independent claim 1. For example, Church does not teach or suggest the limitation of self-completing amplification of the seed molecules via an amplifying reaction to produce the monolayer on a flat surface, wherein self-completing amplification of the seed molecules via an amplifying reaction to produce the monolayer comprises producing a homogeneous area, wherein the homogeneous area comprises a monolayer of molecules on the surface, and wherein the monolayer of molecules on the surface has no diffusive component that can relocate and destroy amplification accuracy. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Furthermore, if an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Additionally, Applicants respectfully submit that there exists a lack of motivation to combine these two references. By way of example, DNA replicated in a gel (such as taught in Church) cannot be metallized in a similar fashion such as taught in Richter. As such, the

motivation for one of ordinary skill in the art to combine these two references is lacking.

Consequently, Applicants respectfully request reconsideration and withdrawal of the rejection of claim 8 under 35 U.S.C. §103(a) as being unpatentable over Church in view of Richter.

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Also, as highlighted above, the Examiner rejected claims 11 and 13 under 35 U.S.C. §103(a) as allegedly being unpatentable over Church in view of Korlach. Specifically, the Examiner, on page 7 of the Office Action, stated that “Church teaches the method of claims 1, 4-
10 7, 9, 10, 14-17 and 20-22, as discussed above.”

As noted above, Applicants respectfully submit that Church does not teach or suggest every claim limitation of amended independent claim 1. For example, Church does not teach or suggest the limitation of self-completing amplification of the seed molecules via an amplifying reaction to produce the monolayer on a flat surface, wherein self-completing amplification of the
15 seed molecules via an amplifying reaction to produce the monolayer comprises producing a homogeneous area, wherein the homogeneous area comprises a monolayer of molecules on the surface, and wherein the monolayer of molecules on the surface has no diffusive component that can relocate and destroy amplification accuracy. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re*
20 *Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Furthermore, if an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Thus, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 11 and 13 under 35 U.S.C. §103(a) as being unpatentable over Church in view of
25 Korlach.

Additionally, as highlighted above, the Examiner additionally rejected claim 12 under 35 U.S.C. §103(a) as allegedly being unpatentable over Church in view of Mian. Specifically, the Examiner, on page 8 of the Office Action, stated that “Church teaches the method of claims 1, 4-7, 9, 10, 14-17 and 20-22, as discussed above.”

5 Applicants respectfully submit that, as detailed above, Church does not teach or suggest every claim limitation of amended independent claim 1. For example, Church does not teach or suggest the limitation of self-completing amplification of the seed molecules via an amplifying reaction to produce the monolayer on a flat surface, wherein self-completing amplification of the seed molecules via an amplifying reaction to produce the monolayer comprises producing a
10 homogeneous area, wherein the homogeneous area comprises a monolayer of molecules on the surface, and wherein the monolayer of molecules on the surface has no diffusive component that can relocate and destroy amplification accuracy. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Furthermore, if an independent claim is
15 nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Additionally, on page 9, the Office Action states that

[r]egarding claim 12, the PCR amplification taught by Mian is controlled
20 by application of a magnetic field (see Example 7, column 16, line 50 - column 18, line 9).

Applicants respectfully submit that the Office Action fails to distinguish an electromagnetic field from a magnetic field, which is a significant distinction. As such, one of ordinary skill in the art would not be motivated to combine these two references in order to perform the limitations of claim 12.

25 Consequently, Applicants respectfully request reconsideration and withdrawal of the rejection of claim 12 under 35 U.S.C. §103(a) as being unpatentable over Church in view of Mian.

Therefore, Applicants submit that all of the pending claims, i.e., claims 1, 4-17 and 20-23, are in condition for allowance, and such favorable action is earnestly solicited.

If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this application, the Examiner is invited to contact the undersigned at the telephone number indicated below.

The Examiner's attention to this matter is greatly appreciated.

Respectfully submitted,



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